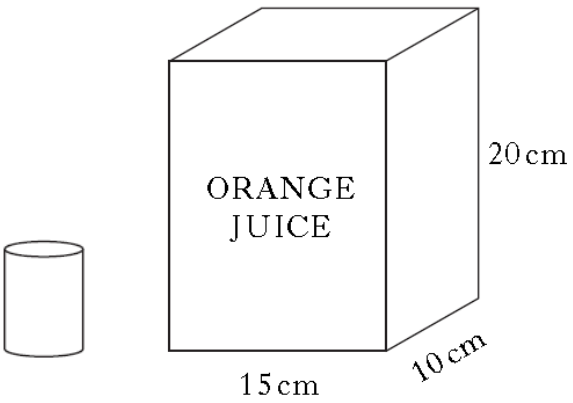
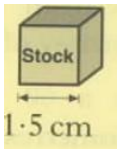
Volume Revision Worksheet L3/4

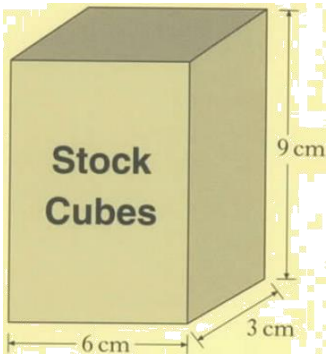
1) Orange juice is poured from a carton into some glasses.
The carton is a cuboid, 15cm long, 10cm wide and 20cm high.
125 cubic cm of juice is poured into each glass.
How many glasses can be poured from the full carton? 3



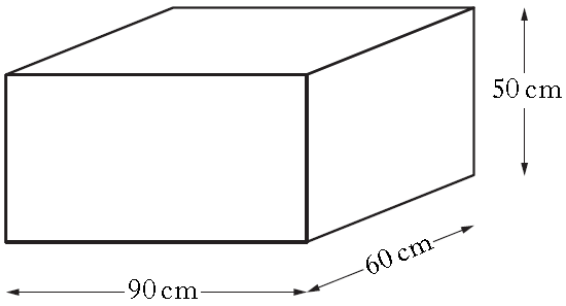
2)a) The edge of a stock cube measures 1·5 cm.
Calculate the volume of the stock cube. 1



2)b) A number of the above stock cubes are packed into a cuboid box.
The box is 6 cm long, 3 cm broad and 9 cm high.
How many stock cubes are needed to fill the box? 3

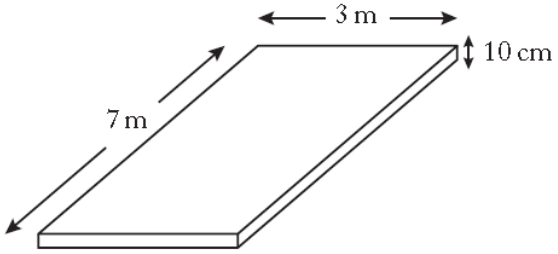


3) This empty tank is to be filled with water.



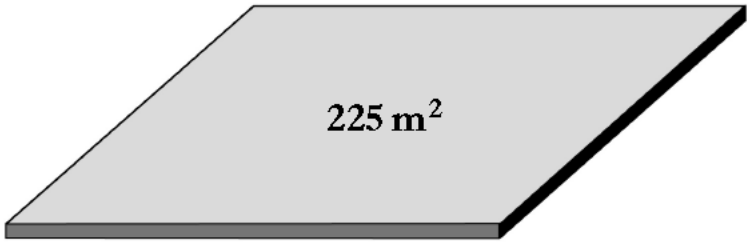
The tank is a cuboid, 90 cm long, 60 cm wide and 50 cm high.
The water fills at a rate of 15 litres every minute. (1 litre = 1000 cm^3)
How long will it take to fill the tank? 4

4) Bob is building a patio with a concrete base.
The base of the patio is 7m long, 3m wide and 10cm deep.



Concrete costs £60 per cubic metre.
Find the total cost of the concrete for the base of Bob's patio. 4

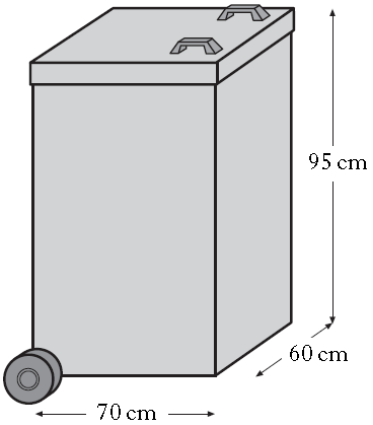
5) The local council is installing a new children's playpark using a rubberised material.



The area of the rectangular playpark is 225 m^2.
The new playpark must have a depth of 12 cm.
The council has ordered 30 cubic metres of the rubberised material for the playpark.
Will this be enough? 4

6)a) A wheelie bin is in the shape of a cuboid.
The dimensions of the bin are:

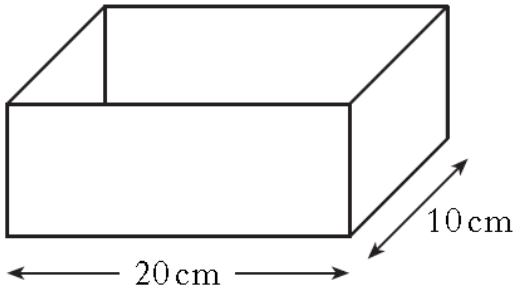
length = 70 cm
breadth = 60 cm
height = 95 cm



Calculate the volume of the bin. 2

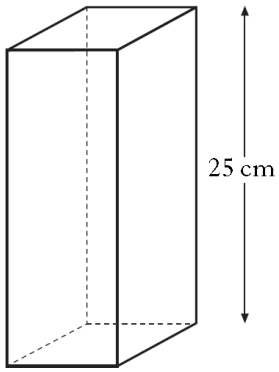
6)b) The council is considering a new design of wheelie bin.
The new bin will have the same volume as the old one.
The base of the new bin is to be a square of side 55 cm.
Calculate the height of the new wheelie bin. 3

7) Shown below is a container in the shape of a cuboid.



When full, the container holds 1600 cubic centimetres of water.
Work out the height of the container 3

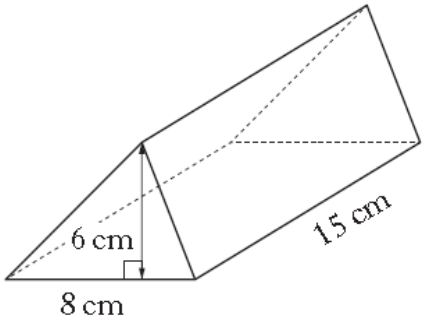
8) A cuboid has a square base.
Its height is 25cm and its volume is 1369 cm^3.
Calculate the length of its base. 3



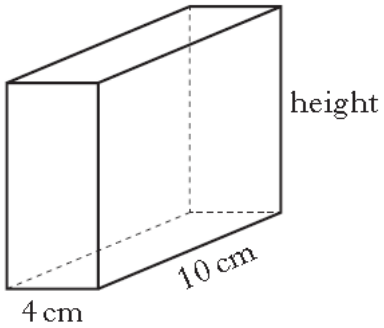
9)a) The formula for the volume of this shape is

Volume = area of end × length

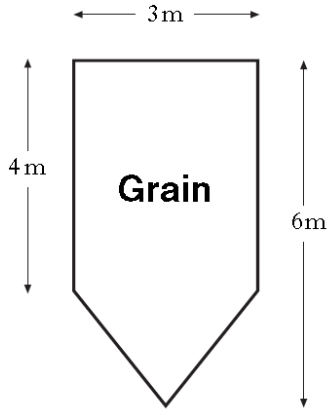
The end of this shape is a triangle.
Use the formula to work out the volume of this shape. 3



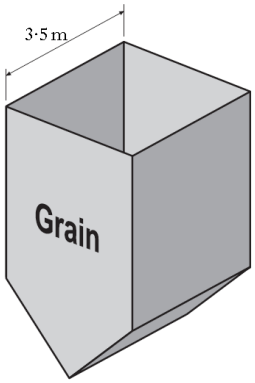
9)b) This cuboid has the same volume as the shape shown above.
Find the height of the cuboid. 2



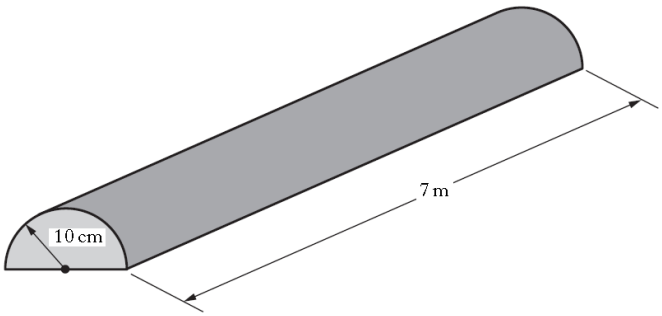
10)a) The end face of a grain hopper is shown in the diagram.
Calculate the area of the end face. 3



10)b) The grain hopper is in the shape of a prism with a length of 3·5 m.
Find the volume of the hopper. 3



11) A plastic speed bump in the shape of a half cylinder is used to slow traffic outside a Primary School.
The speed bump has a radius of 10 cm and a length of 7 m as shown in the diagram.



Calculate the volume of plastic used to make the speed bump. 3

ANSWERS

1) $V = lbh$
$V = 15 \times 10 \times 20$
$V = 3000cm^3$

$3000 \div 125 = 24$ glasses

2)a) $V = lbh$
$V = 1{\cdot}5 \times 1{\cdot}5 \times 1{\cdot}5$
$V = 3{\cdot}375cm^3$

2)b) $6 \div 1{\cdot}5 = 4$
$3 \div 1{\cdot}5 = 2$
$9 \div 1{\cdot}5 = 6$
$4 \times 2 \times 6 = 48$ cubes fill the box

3) $V = lbh$
$V = 90 \times 60 \times 50$
$V = 270\,000cm^3$
$V = 270$ litres

$270 \div 15 = 18$ minutes

4) $V = lbh$
$V = 3 \times 7 \times 0{\cdot}1$
$V = 2{\cdot}1m^3$

$2{\cdot}1 \times 60 = £126$

5) $V = Ah$
$V = 225 \times 0{\cdot}12$
$V = 27m^3$

30m3 will be enough for the playpark

6)a) $V = lbh$
$V = 70 \times 60 \times 95$
$V = 399\,000\ cm^3$

6)b) $V = lbh$
$399\,000 = 55 \times 55 \times h$
$399\,000 = 3025 \times h$
$h = 399\,000 \div 3025$
$h = 131{\cdot}9cm$

7) $V = lbh$
$1600 = 20 \times 10 \times h$
$1600 = 200 \times h$
$h = 1600 \div 200$
$h = 8cm$

8) $V = lbh$
$1369 = l \times l \times 25$
$l \times l = 1369 \div 25$
$l \times l = 54.76$
$l = \sqrt{54{\cdot}76}$
$l = 7{\cdot}4cm$

9)a) $A = \frac{1}{2}\,bh$
$A = \frac{1}{2} \times 8 \times 6$
$A = 24cm^2$

$V = \text{area} \times \text{length}$
$V = 24 \times 15$
$V = 360cm^3$

10)a) $A = lb$
$A = 3 \times 4$
$A = 12m^2$

$A = \frac{1}{2}\,bh$
$A = \frac{1}{2} \times 3 \times 2$
$A = 3m^2$

Total Area
$= 12 + 3$
$= 15m^2$

9)b) $V = lbh$
$360 = 4 \times 10 \times h$
$360 = 40 \times h$
$h = 360 \div 40$
$h = 9cm$

10)b) $V = Ah$
$V = 15 \times 3{\cdot}5$
$V = 52{\cdot}5m^3$

11) $A = \frac{1}{2} \pi r^2$

$A = \frac{1}{2} \times \pi \times 0{\cdot}1^2$

$A = 0{\cdot}0157 m^2$

$V = Ah$

$V = 0{\cdot}0157 \times 7$

$V = 0{\cdot}11 m^3$